Claim Amendments

1- (original) A probe card contact apparatus including:

a formed rigid substrate having a first major surface, and a second major surface,

a flexible dielectric film patterned on one of said surfaces to form a plurality of electrically conductive leads terminated in contact pads on both ends,

said dielectric film adhered to the substrate, and wrapped around the outer edges, such that the contact pads on one end of the leads are positioned on the first surface of the substrate and those on the opposite end are positioned on the second surface, and

a contact element protrusion affixed to each of said contact pads.

2-(original) An apparatus as in claim 1 wherein the substrate has a coefficient of thermal expansion in the range of 2 to 10 PPM.

3-(original) An apparatus as in claim 1 wherein said substrate comprises a ceramic.

4-(original) An apparatus as in claim 1 having an opening in the center.

5-(original)An apparatus as in claim 1 wherein said dielectric film comprises a polymer, such as a polyimide.

6-(original) An apparatus as in claim 1 wherein said dielectric film is in the range of 0.005 to 0.03 inches thick.

7-(original) An apparatus as in claim 1 wherein said leads and pads comprise a first layer of copper and second layer of tin.

8-(original) An apparatus as in claim 1 wherein said leads and pads comprise tin.

9-(original) An apparatus as in claim 1 wherein said metal is ductile.

10-(original) An apparatus as in claim 1 wherein said traces are patterned by laser ablation.

11-(original) An apparatus as in claim 1 wherein the design of said conductor pattern of leads and pads is software generated and input to a laser.

12-(original) An apparatus as in claim 1 wherein said contact pads on the first surface mirror input/output pads on an integrated circuit to be tested.

13-(original) An apparatus as in claim 1 wherein said contact pads on the second surface mirror electrical contacts on a probe card.

14-(original)An apparatus as in claim 1 wherein said contact element protrusions comprise a noble metal.

15-(original) An apparatus as in claim 1 wherein said contact elements are stud bumps.

16-(original) An apparatus as in claim 1 wherein said contact elements are microwires.

17-(original) An apparatus as in claim 1 wherein said contact pads and elements are arrayed placed in an area array.

18-(currently amended) An apparatus as in claim 1 wherein said contact pads and elements are spaced more closely on the first surface than on the second surface.

19-(original) An apparatus as in claim 1 wherein the inductance of said leads is customized.

20-(original) An apparatus as in claim 1 where in a ground plane is patterned on the second surface of said flexible film.

21-(original) An electrical test probe card including:

- a composite plastic disc having a plurality of electrical traces terminating on one end at the outer perimeter to a tester probe head, and centrally located terminals electrically attached to a chip contact apparatus,

said chip contact apparatus comprising a formed rigid substrate having a first major surface, and a second major surface,

a flexible dielectric film patterned on one of said surfaces to form a plurality of electrically conductive leads having contact pads on both ends,

said dielectric film adhered to the substrate, and wrapped around the outer edges, such that the contact pads on one end of the leads are positioned on the first surface of the substrate and those on the opposite end are positioned on the second surface, and

a contact element protrusion affixed to each of said contact pads.

22-(original) A method of forming a probe card contact apparatus including the following steps:

-providing a rigid substrate having thermal expansion characteristics similar to that of silicon, and which mechanically conforms to a probe card holding mechanism,

-providing a flexible dielectric film having a layer of highly conductive, ductile metal on one surface,

-patterning an array of chip contact pads, the contact locations of a probe card, and the lead traces to interconnect the first and second sets of pads,

etching the excess metal to form the contact and lead patterns,

- bonding a contact element on each of said contacts,

-aligning and adhering said film to the first surface of said substrate, wrapping around the outer edges, and terminating on the second surface.

23-(original) A method of forming a probe card contact apparatus including the following steps:

-providing a rigid substrate having thermal expansion characteristics similar to that of silicon, and which mechanically conforms to a probe card holding mechanism,

-providing a flexible dielectric film having a layer of highly conductive, ductile metal on one surface,

-inputting the patterns of chip input/output pads, the contact locations of a probe card, and the lead traces to interconnect the first and second sets of pads to a software program compatible with a computer controlled laser,
laser ablating the excess metal to form the contact and lead patterns,
- bonding a contact element on each of said contacts,
- aligning and adhering said film to the first surface of said substrate, wrapping around the outer edges, and terminating on the second surface.

24-(original) A method as in claim 21 of forming said contact elements by a programmable wire bonding equipment.

25-(original) A method of forming an apparatus as in claim 22 wherein multiple layers of metal on the flexible film are patterned by first laser ablating the topmost layer, and chemically etching the remaining metal layers.

26-(original) A method of forming an apparatus as in claim 21 wherein said substrate is coated with a thermally stimulated adhesive, and the film is adhered to the substrate by heating the assemblage.